PB80-224058

NOx National Emission Inventory Estimates

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Aug 80

U.S. Department of Commerce
National Technical Information Service
NTIS.

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-AA-TEB-80-19	2.	3. REC PB80-224058
4. TITLE AND SUBTITLE NOx National Emission Inventory Estimates		5. REPORT DATE August 1980
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Mark Wolcott		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Environmental Protection Agency Office of Mobile Source Air Pollution Control Test and Evaluation Branch Ann Arbor, Michigan 48105		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS SAME		13. TYPE OF REPORT AND PERIOD COVERED Technical
		14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report presents the current and projected estimates of the national emissions inventory for oxides of nitrogen (NOx). A description of the methodology used to calculate the inventory is also provided. These inventories were used in the acid rain analysis performed in support of the Draft Regulatory Analysis, Environmental Impact Statement and NOx Pollutant Specific Study for Proposed Gaseous Emission for 1985 and Later Model Year Light Duty Trucks and Heavy Duty Engines. The emphasis of this report is on the projected change in national NOx emissions from 1977 to 1999. The impact of the proposed regulations on rain acidity is assumed to be proportional to total NOx emissions. While the inventories were used to support the draft regulatory analysis, they can also be used independently since an inventory is presented for the currently promulgated regulations as well as for the proposed regulations.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Motor vehicles Air Pollution Exhaust emissions Nitrogen Oxides Exhaust gases Computerized simulation Inventory models Regulations Mathematical models	Oxides of nitrogen Acid rain	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release unlimited	Unclassified	32
	20. SECURITY CLASS *(This page)*	22. PRICE
	Unclassified	

EPA Form 2220-1 (9-73)

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

EPA-AA-TEB-80-19

NOx National Emission Inventory Estimates

Mark Wolcott
August 1980

Test and Evaluation Branch
Emission Control Technology Division
Mobile Source Air Pollution Control
Office of Air, Noise, and Radiation
Environmental Protection Agency

NOx National Emission Inventory Estimates

This report presents the current and projected estimates of the national emissions inventory for oxides of nitrogen (NOx). A description of the methodology used to calculate the inventory is also provided. These inventories were used in the acid rain analysis performed in support of the Draft Regulatory Analysis, Enviromental Impact Statement and NOx Pollutant Specific Study for Proposed Gaseous Emission for 1985 and Later Model Year Light Duty Trucks and Heavy Duty Engines (referred to hereafter as the 1985 NOx Regulatory Analysis). (Reference 1.) The emphasis of this report is on the projected change in national NOx emissions from 1977 to 1999. The impact of the proposed regulations on rain acidity is assumed to be proportional to total NOx emissions. While the inventories were used to support the draft regulatory analysis, they can also be used independently since an inventory is presented for the currently promulgated regulations as well as for the proposed regulations.

Acid rain is a term used to describe precipitation that is more acidic than normal precipitation. Usually, the acid is either nitric or sulfuric. In simplest terms, the amount of nitric acid in the air is assumed to be proportional to the amount of NOx emitted into the atmosphere. Since transportation sources contribute a large share of NOx to the atmosphere, regulations that reduce NOx are expected to decrease the nitric acid contribution to acid rain.

Acid rain has been linked to declining fish populations in the Northeast. In the Adirondack Mountains, 45 percent of the lakes above 600 altitude meters are devoid of fish. Fifty years ago fish were absent from only 4 percent of these same lakes. Foliage can also be affected. Tissue death, loss of leaf area and accelerated loss of nutrients occurs in the presence of acid rain. In addition, damage to certain materials has been reported. High acidity seems to promote corrosion of steel and copper. (References 2, 3, and 4.) Clearly, the potential economic cost of acid rain induced damage is large.

Base Year Emission Inventory

No attempt is made in this paper to assess the costs of acid rain. Instead, a national NOx inventory and, therefore, the potential degree of rain acidity, is developed from available data.

Total highway mobile source emissions were calculated for each of the three regions of the country (low altitude 49-state, high altitude, and California). Since the emission factors for the three regions are different, the number of vehicle miles traveled (VMT) by each type of vehicle must be estimated for each of the regions in order to calculate a total emissions inventory. The procedure described in Reference 5 was used to distribute FHwA estimated VMT among four vehicle classes: light duty vehicles (LDV), light duty trucks (LDT), heavy duty gasoline trucks (HDG) and heavy duty diesel trucks (HDD). The national VMT distibution by vehicle class was assumed to apply in each of the three regions. However, no adjustment was made to account for the fact that total VMT is accumulated under both urban and rural driving conditions. Since the emission factors used to estimate future inventories assume that

mileage is accumulated under only urban driving conditions, all VMT in each of the three regions was also assumed to be accumulated under those conditions. Further, since individual county VMT is not readily available for high altitude counties, total Colorado VMT was used as a surrogate for high altitude VMT. Low altitude 49-state VMT was assumed to equal total nationwide VMT minus high altitude and California VMT.

Table 1 presents the highway mobile source NOx inventory for calendar year 1977. The emission factors came from a modified version of MOBILE1. (Reference 6.) The modified emission estimates correspond to the emission factors used in the regulatory analysis for 1985 and later LDT and HDV NOx. VMT was derived from FHwA figures.

As Table 1 shows, light duty vehicles accounted for 55 percent of national 1977 highway mobile source NOx emissions. Light duty trucks accounted for 13 percent. Heavy duty gasoline and diesel trucks accounted for 11 and 21 percent, respectively, of total highway mobile source emissions.

Off-highway mobile sources, which are not listed in Table 1, include aircraft, vessels and locomotives. The 1977 levels were estimated according to the standard National Emissions Data System (NEDS) procedures and totaled 2,160,000 tons.

Table 2 presents the 1977 NEDS stationary area source NOx inventory. (Reference 7.) These six categories also correspond to those used in the 1985 NOx Regulatory Analysis. During 1977, residential oil and gas combustion accounted for 30 percent of total stationary area source NOx emissions. Commercial oil and gas accounted for 24 percent of emissions. The industrial coal and industrial oil and gas sources accounted for 7 and 20 percent, respectively, of stationary area source NOx. All other stationary area sources accounted for 18 percent.

All stationary area sources contributed 1,263,700 tons of NOx in 1977. Stationary point sources, such as power plants, contributed 11,057,100 tons. Finally, total mobile sources contributed 9,453,600 tons of NOx in 1977. According to the estimation procedures described, a grand total of 21,774,400 tons of NOx were emitted into the atmosphere in 1977. See Table 3.

Future Year Inventory

To ascertain the likely effect of the proposed 1985 LDT and HDV NOx regulations on rain acidity, it is necessary to project the national NOx inventory for the years when the regulation would be in effect. The modified linear rollback model (ROLLBACK) was used to project NOx emission inventories for 1985, 1990, 1995 and 1999. (Reference 8.) These are also the same projection years used in the air quality analysis performed in support of the forthcoming 1985 NOx Regulatory Analysis. To project base year inventories into the future, both growth and future control rate assumptions must be made. Growth refers to the increase in activity level of each pollution source. The two levels of growth considered in this paper are listed in Table 4. It seems likely that the actual growth rates will fall within the growth ranges listed. The growth rates that are assumed for each emissions category are presented in

that table. (Reference 9.) For highway mobile sources the activity level is measured as vehicle miles traveled. Other measurement units for activity levels are used for stationary sources.

Future control refers to the degree to which emissions are expected to be reduced given a constant activity level. Emissions are measured in units of grams per mile traveled for highway mobile sources. Mobile source control measures are implicit in the emission factors produced by the computer program MOBILE1. (Reference 6.) To project the effect of highway mobile source controls, the ratios of future to base year emission factors are applied to the base year inventory. Table 5 lists the NOx highway mobile source emission factor ratios used to estimate future emissions. The MOBILE1 results from which these ratios were calculated are presented in Appendix A. In 1980 light duty vehicles are expected to emit 2.66 grams of NOx per mile traveled. This rate is 82 percent of the corresponding 1977 level.

The ratios presented in Table 5 are not identical to those presented in the regulatory analysis. Since the 1977 individual AQCR emissions inventories have not yet been published, 1976 NEDS inventories were used in the 1985 NOx Regulatory Analysis. For that analysis, emission factor ratios were also calculated from the 1976 base year. However, the national NOx inventory work was based on calendar year 1977. Hence, the ratios presented in Table 5 reflect a 1977 base year rather than the 1976 base year used in the regulatory analysis.

In the case of stationary sources, the control rates are applied to the base inventory directly. New source performance standards (NSPS) were assumed to apply to newly constructed stationary area sources beginning in 1983. The NSPS control efficiencies are also listed in Table 4. Reasonable available control technology (RACT) was not assumed for existing stationary area sources since in 1977 only a few areas violated the present 100 ug/m^3 annual average NO2 National Ambient Air Quality Standard (NAAQS). Finally, a zero retirement rate was assumed for all stationary sources. This is a worst case assumption in the sense that emission projections would be lower with a positive retirement rate.

Figures 1 and 2 present the results of the inventory projections and show how the relative contributions of the various emission sources change over time. These figures assume no further control other than what has already been mandated. Figure 1 shows the contribution of mobile, stationary area and stationary point sources for the 1977 base year and each projection year thereafter, assuming that low growth rates prevail during this time. Figure 2 shows the relative contribution of each mobile source to total mobile emissions for each evaluation year.

As indicated in Figure 1, total NOx emissions are expected to increase in every projection year from 1977 through 1999. Growth in stationary point source emissions overshadows the reduction in mobile source emissions through 1985. Thereafter, both mobile and stationary source emissions are expected to increase. By 1999, mobile source emissions are expected to be greater than they were in 1977. This increase in mobile source emissions can be traced to growth in both heavy duty diesel and off-highway mobile sources. As Figure 2 shows, over that two decade period the proportion of mobile source emissions

accounted for by light duty vehicles declines from 42 to 25 percent. On the other hand, the proportion of emissions accounted for by heavy duty diesels more than doubles, from 16 to 37 percent. The proportion of mobile source emissions accounted for by off-highway vehicles also increases, from 23 to 27 percent.

Figures 3 and 4 present the inventory results assuming that high growth rates prevail. The pattern shown in Figure 1 is accentuated in Figure 3. With high growth, total 1999 NOx emissions are expected to increase an additional 3,352,600 tons from the 1999 low growth projection. The 1999 NOx level represents a 44 percent increase from the 1977 level. Further, the share of total 1999 emissions accounted for by mobile sources increases from 35 to 42 percent. The decrease in the relative contributions of HDD and HDG trucks shown in Figure 4, as compared to Figure 2, reflects the fact that the growth rates associated with these two vehicle classes were held constant between the high and low growth scenarios. The growth rates associated with the other three vehicle classes were increased by one percentage point each from the low to high growth scenarios.

1985 NOx Regulatory Analysis

The projections presented in Figures 1 and 2 assume the degree of mobile source control mandated by present regulations. More stringent NOx controls on light duty trucks and heavy duty engines are being proposed for 1985 and later model year vehicles. Currently, the proposed regulations are 0.9 gram per mile for LDT and 1.7 grams per brake horsepower hour for HDV and represent a 75 percent reduction from 1972-1973 baseline NOx emissions.

The emission factor ratios that were used to adjust the inventory to reflect these additional controls are presented in Table 6. (Reference 10.) For the reasons previously stated, these ratios are not identical to those used in the regulatory analysis. Rather, they are the ratios of the future year emission factors divided by the 1977 base year emission factors.

The effect of imposing the more stringent controls is presented in Figures 5 through 8. With the currently promulgated mobile source controls on NOx, the total NOx emissions in 1999 are expected to be 29 percent greater than the 1977 levels. Total NOx emissions are projected to increase by only 13 percent over the same time frame, if the more stringent controls proposed for 1985 and later model year light duty trucks and heavy duty engines are implemented. A further comparision of Figures 1 and 5 shows that if low growth rates prevail, there would be a 35 percent reduction from the base case in 1999 NOx emissions from mobile sources due to the proposed 1985 and later NOx regulations. If high growth rates prevail, there would be a 28 percent reduction in mobile source NOx. Similarly, if low growth rates prevail, the total 1999 NOx emissions for all sources would be reduced 13 percent from the base case due to the regulations. If high rates prevail, the reduction due to the regulations would be 12 percent for all sources.

Summary

Estimates of the national NOx emission inventory constructed for this analysis indicate that total NOx emissions will increase in every calendar year from 1977 through 1999. Without further regulatory action, total NOx emissions in 1999 are projected to be 29 percent greater than 1977 levels. With the more stringent controls proposed for 1985 and later model year light duty trucks and heavy duty engines, total NOx emissions are projected to increase by only 13 percent. If one assumes a proportional relationship between the acidity of rain and total NOx emissions, then the expected increases in NOx emissions will have a detrimental effect on the nation's buildings and lakes. The proposed regulations would limit the damage by reducing potential nitric acid content of acid rain.

Table 1
1977 Highway Mobile Sources NOx Emissions Inventory

	Low-Altitude 49-State			California			High Altitude			National Total		
	VMT ($\times 10^6$ miles)	EF (g/m)	Emissions (tons)	VMT ($\times 10^6$ miles)	EF (g/m)	Emissions (tons)	VMT ($\times 10^6$ miles)	EF (g/m)	Emissions (tons)	VMT ($\times 10^6$ miles)	Emissions (tons)	Percent
LDV	1,010,713	3.24	3,609,750	116,164	2.89	370,061	14,338	2.22	35,087	1,141,215	4,014,898	55.0
LDT	175,074	4.37	843,349	20,122	4.205	93,270	2,483	2.82	7,718	197,679	944,337	12.9
HDG	66,669	10.03	737,105	7,662	9.95	84,037	946	6.40	6,674	75,277	827,816	11.4
HDD	55,260	22.10	1,346,193	6,352	21.41	149,910	784	12.10	10,457	62,396	1,506,560	20.7
Total	1,307,716		6,536,397	150,300		697,278	18,551		59,936	1,476,567	7,293,611	100.0

* Modified MOBILE1 emission factors and FHwA VMT were used to develop the inventory. The MOBILE1 modifications are described in Reference 6.

Table 2

NEDS 1977 Stationary Source NOx Emissions Inventory

	Sub-Total (tons)	Totals (tons)
Residential Oil and Gas		383,448
Anthracite Coal	1,494	
Bituminous Coal	922	
Distillate Oil	166,358	
Residual Oil	0	
Natural Gas	214,674	
Commercial Coal - Area		8,736
Anthracite	7,378	
Bituminous	1,358	
Commercial Oil and Gas - Area		304,641
Residual Oil	128,813	
Distillate Oil	45,570	
Natural Gas	130,258	
Industrial Coal		84,382
Anthracite	58	
Bituminous	84,275	
Coke	49	
Industrial Oil and Gas - Area		249,315
Residual Oil	80,316	
Distillate Oil	46,796	
Natural Gas	122,117	
Process Gas	86	
Other - Area		233,189
Total		1,263,711

Table 3

1977 National NOx Emissions Inventory

Source	Total NOx Emissions (1000 Tons)
Stationary Area	1,263.7
Stationary Point	11,057.1
Mobile	9,453.6
Total	21,774.4

Table 4

Mobile and Stationary Source Growth Rates and NSPS Control Efficiencies

	Low Growth (percent)	High Growth (percent)	NSPS @ Control Efficiency (percent)
Mobile Sources			
Light Duty Vehicles	+1.0	+3.0	*
Light Duty Trucks	+1.0	+3.0	*
Heavy Duty Gasoline Trucks	-2.0	-2.0	*
Heavy Duty Diesel Trucks	+5.0	+5.0	*
Off-Highway Vehicles	+1.0	+3.0	*
Stationary Area Sources			
Residential Oil and Gas	+1.0	+2.0	50
Commercial Coal	+1.0	+2.0	24
Commercial Oil and Gas	+1.0	+2.0	50
Industrial Coal	+1.0	+2.0	24
Industrial Oil and Gas	+1.0	+2.0	50
All Other	+1.0	+2.0	0
Stationary Point Sources	+2.5	+2.5	0

@ Assumed to apply in 1983 and later calendar years.

* Mobile source control efficiencies are incorporated in the emission factors predicted by MOBILE1 and are therefore not estimated separately.

Table 5

Mobile Source Emission Factor Ratios - Base Case ($x10^2$)

Region	Projection Year*	LDV	LDT	HDG	HDD
Low Altitude Non-California	80	82	85	97	96
	85	56	65	96	88
	90	49	59	96	86
	95	48	57	95	86
	99	48	57	95	86
California	80	78	81	94	84
	85	56	55	85	69
	90	52	45	78	62
	95	52	43	75	61
	99	52	43	74	61
High Altitude	80	94	87	98	100
	85	73	69	97	101
	90	70	65	95	102
	95	71	64	93	102
	99	71	64	93	102

* 1977 Base Year

Table 6

Mobile Source Emission Factor Ratios - Control Case ($x10^2$)

Region	Projection Year*	LDV	LDT	HDG	HDD
Low Altitide Non-California	80	82	85	97	96
	85	56	63	91	81
	90	49	40	50	33
	95	48	29	32	21
	99	48	26	27	19
California	80	78	81	94	84
	85	56	55	82	65
	90	52	45	46	30
	95	52	43	30	20
	99	52	43	26	19
High Altitude	80	94	87	98	100
	85	73	68	93	93
	90	70	50	58	39
	95	71	41	43	25
	99	71	39	39	22

* 1977 Base Year

FIGURE 1 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: BASECASE - LOW GROWTH

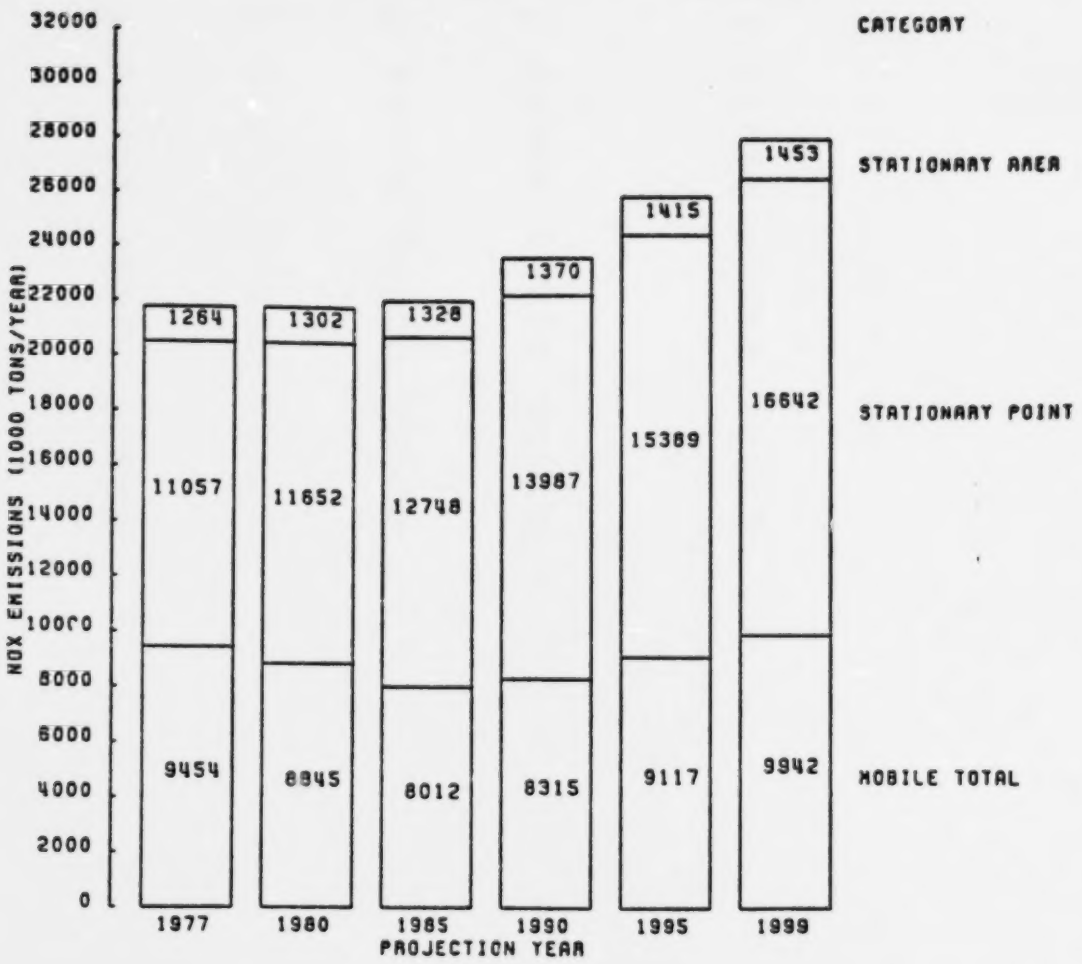


FIGURE 2 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: BASECASE - LOW GROWTH

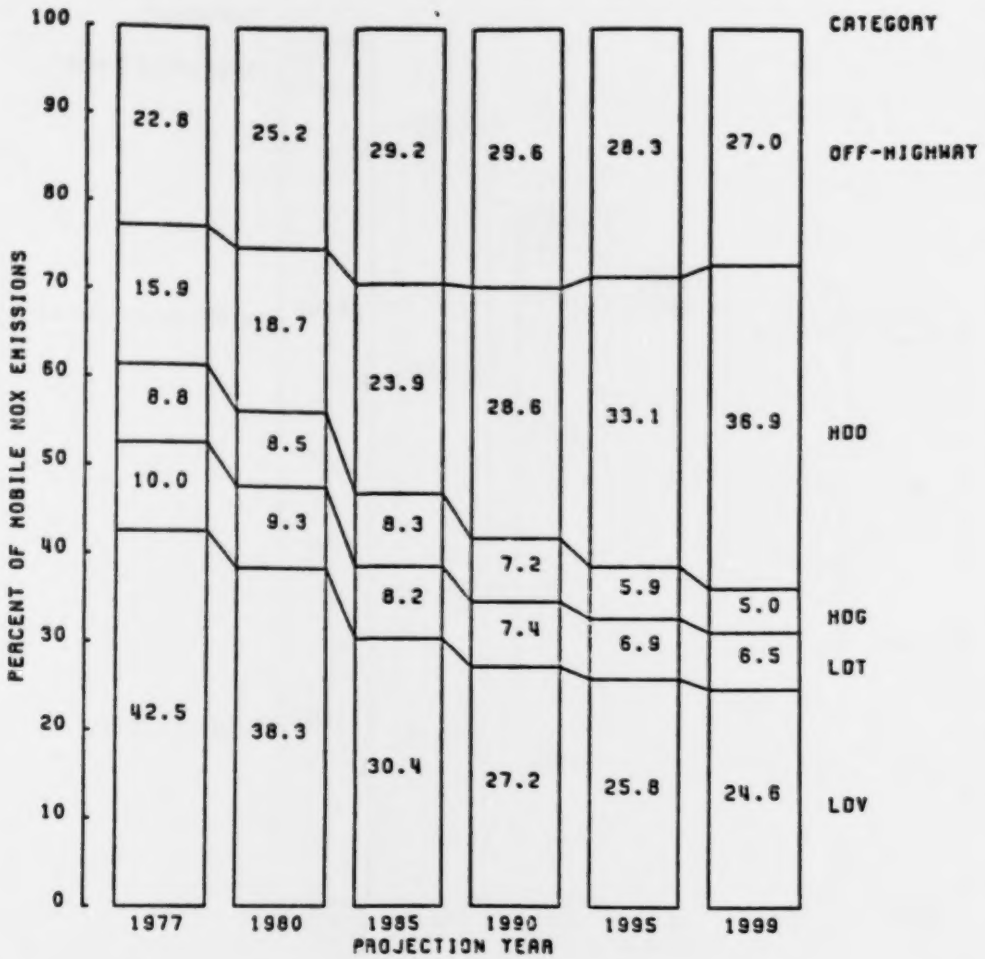


FIGURE 3 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: BASECASE - HIGH GROWTH

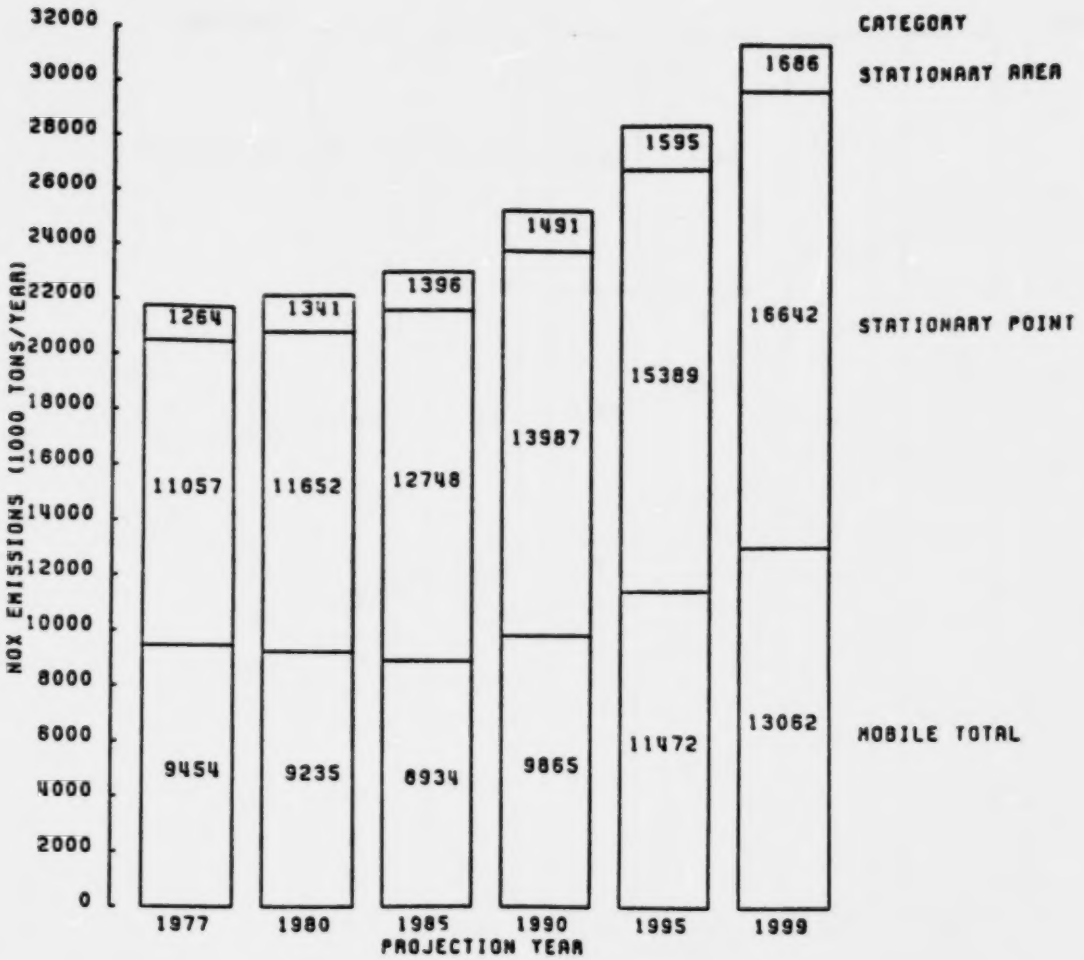


FIGURE 4 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: BASECASE - HIGH GROWTH

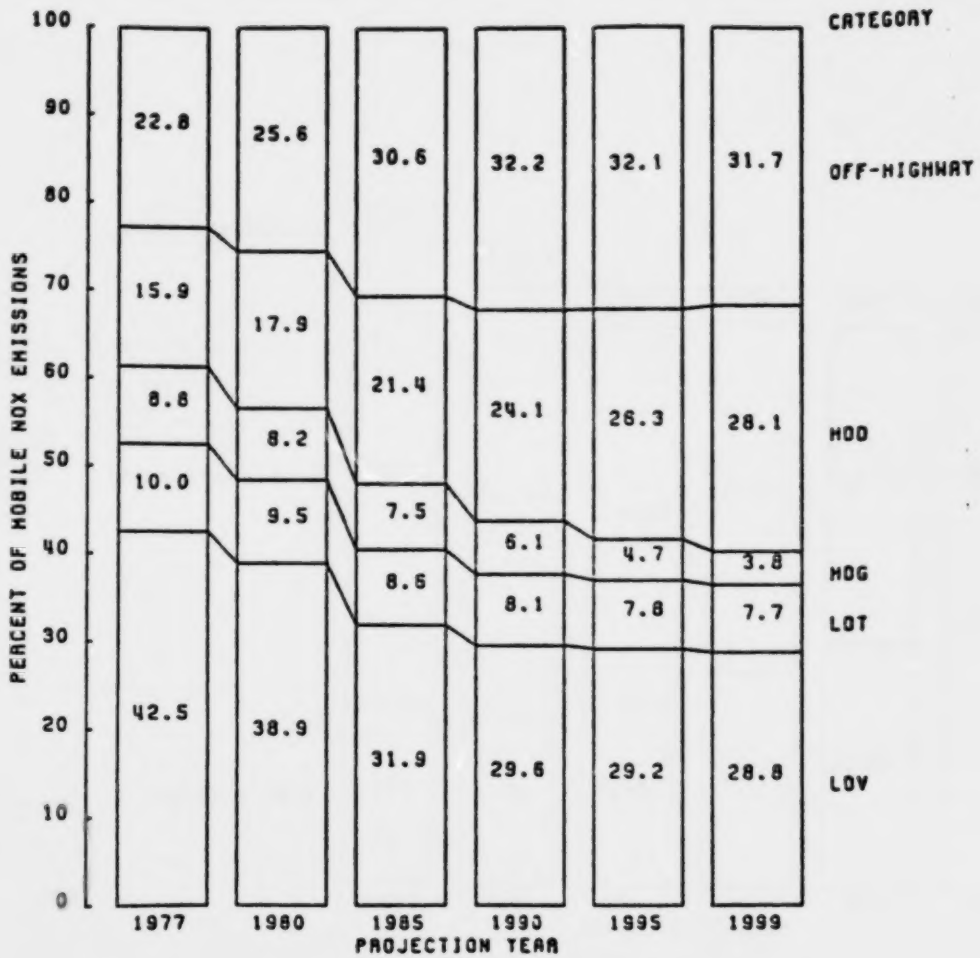


FIGURE 5
NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: CONTROLCASE - LOW GROWTH

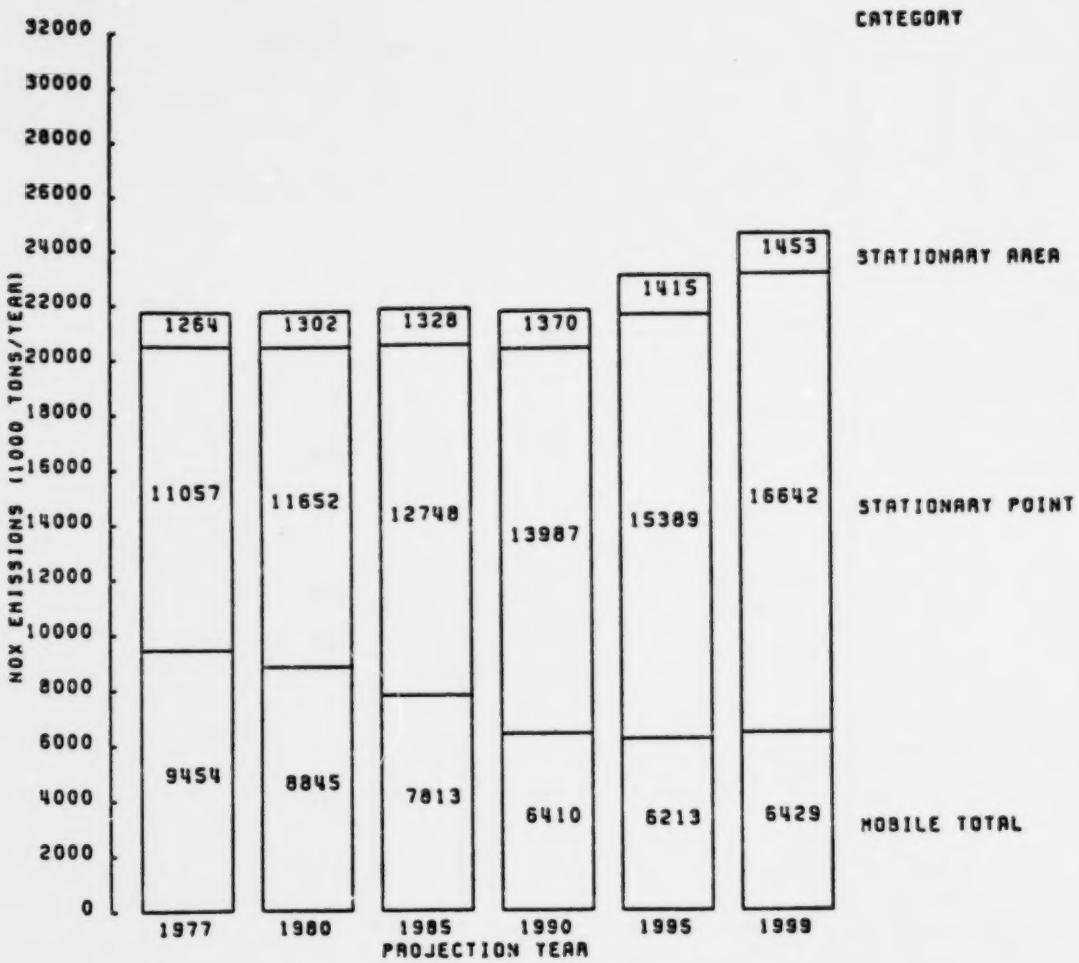


FIGURE 6 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS; CONTROLCASE - LOW GROWTH

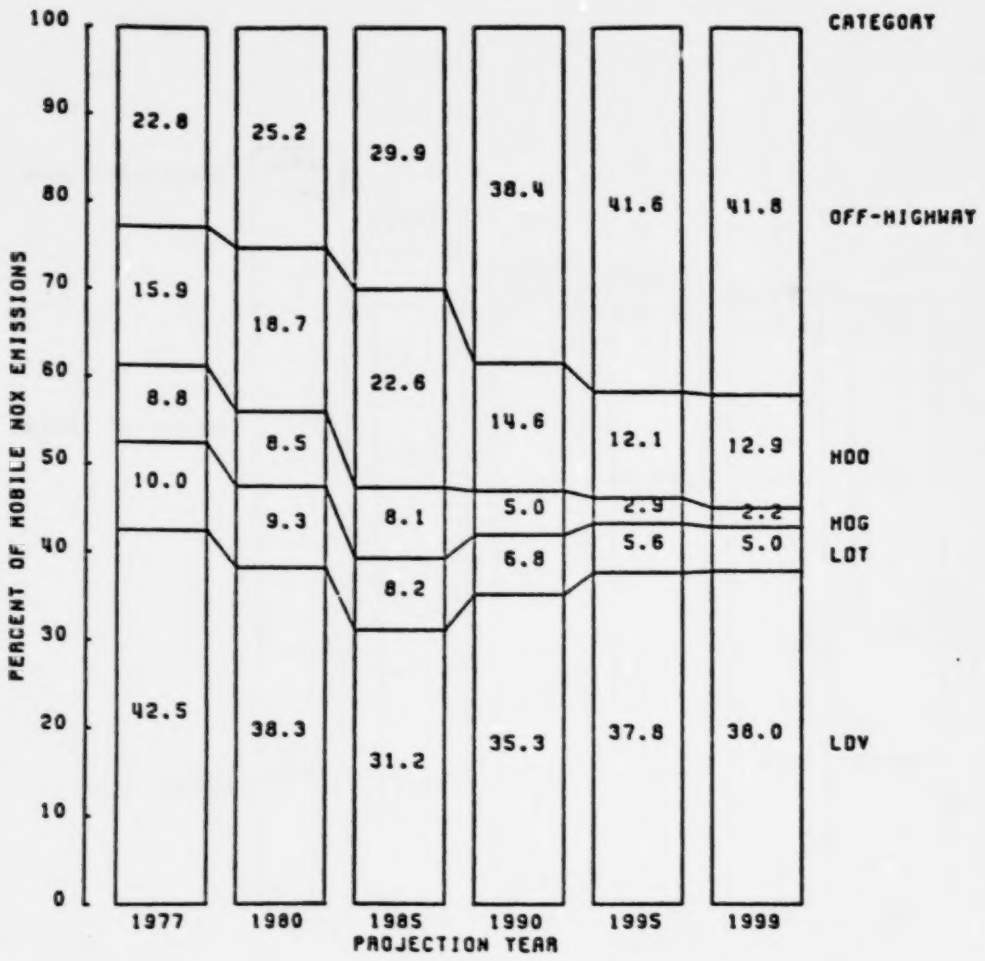


FIGURE 7 NOX NATIONAL INVENTORY PROJECTION
1985 LOT. MOV REGULATORY ANALYSIS: CONTROLCASE - HIGH GROWTH

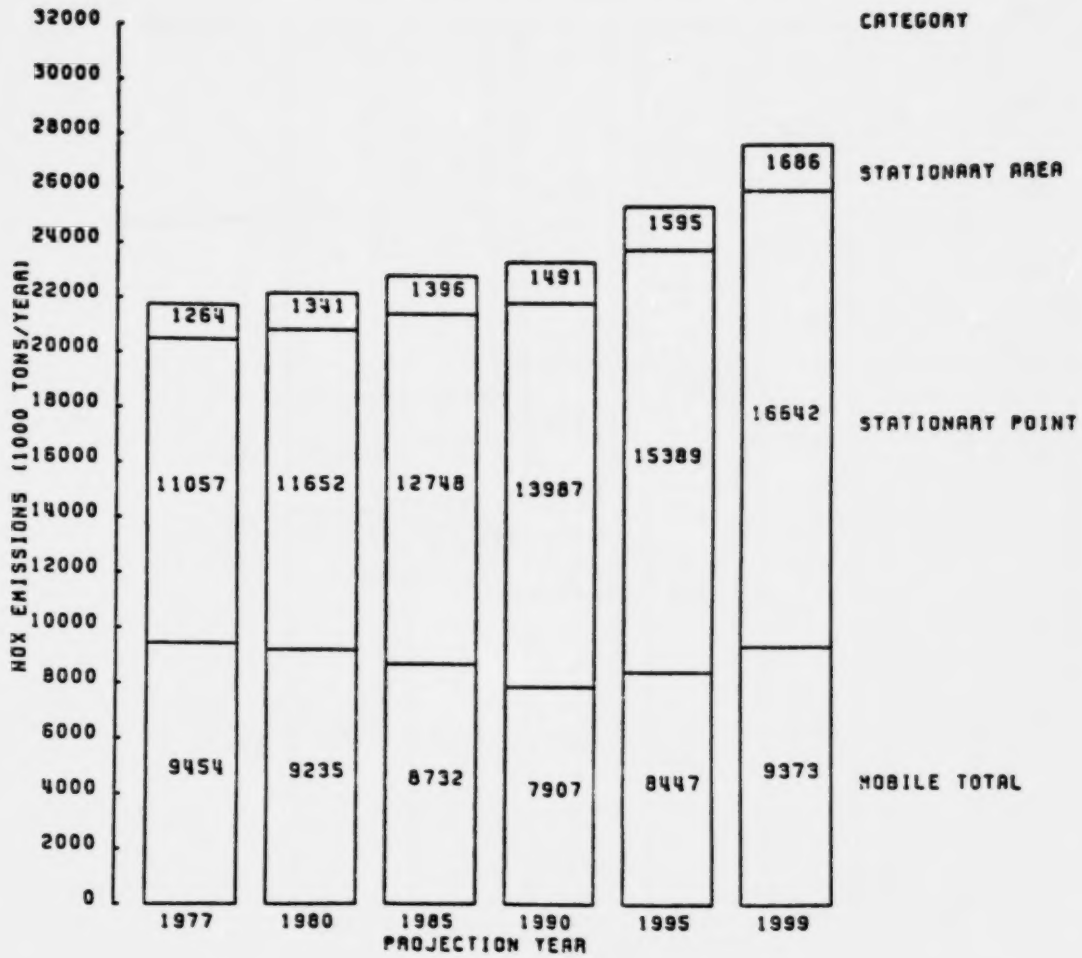
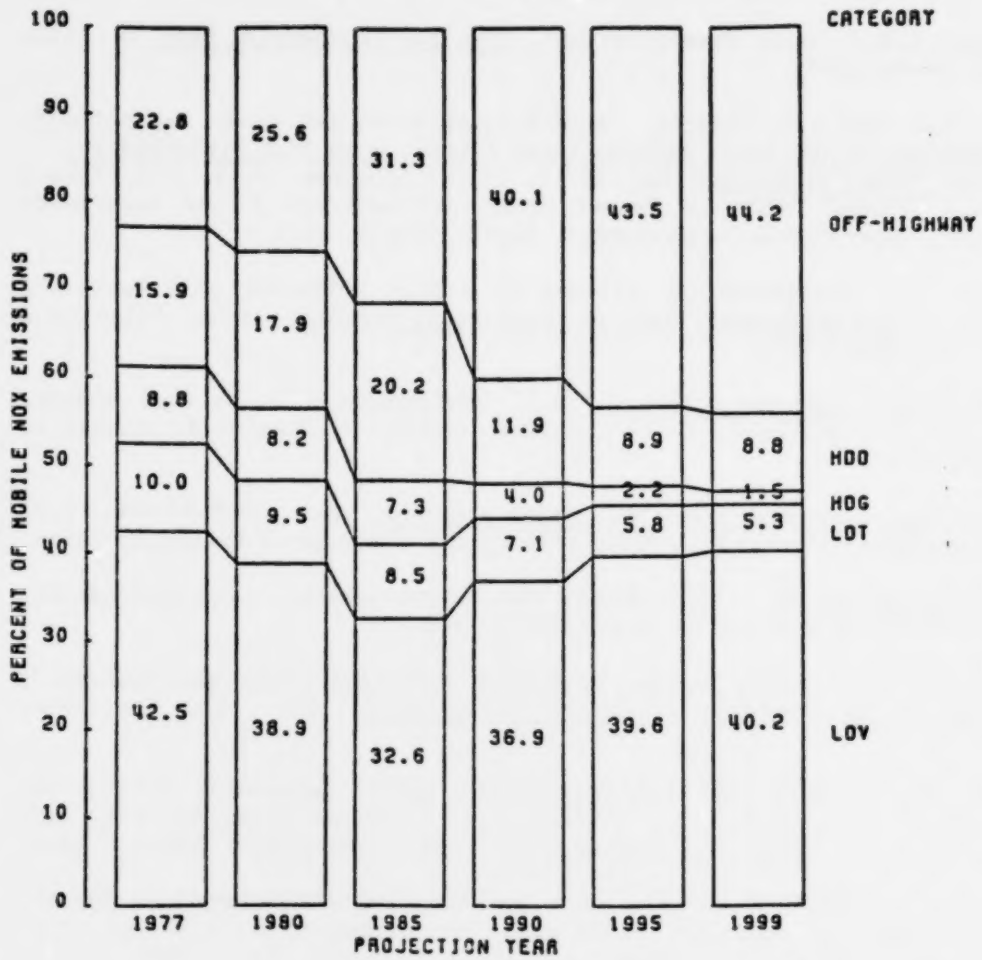


FIGURE 8 NOX NATIONAL INVENTORY PROJECTION
1985 LDT, HDV REGULATORY ANALYSIS: CONTROLCASE - HIGH GROWTH



References

1. Draft Regulatory Analysis, Environmental Impact Statement and NOx Pollutant Specfic Study for Proposed Gaseous Emissions or 1985 and Later Model Year Light Duty Trucks and Heavy Duty Engines, U.S. Environmental Protection Agency, Ann Arbor, Michigan, 1980.

2. Likens, G.E., "Acid Precipitation", Chemical Engineering News 54 (48), pages 29-44, 1976.

3. Tamm, C.O. and E.B. Cowling, "Acid Precipitation and Forest Vegitation", Proceedings of the First International Symposium on Acid Precipitation and the Forest Ecosystem, May 12-15, 1975, Columbus, Ohio, U.S. Forest Service General Technical Report NE-23, Northeastern Forest Experiment Station, Upper Darby, Pennsylvania, pages 845-856, 1976.

4. Nriagn, J., "Deteriorative Effects of Sulfer Pollution on Materials", Sulfer in the Environment Part II: Ecological Impacts, John Wiley and Sons, New York, 1978.

5. NADB Internal Operations Manual, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, Section 2, Chapter 8, Subject 4, pages 11-12.

6. Mobile Source Emission Factors: Final Document, EPA 400/9-78-006, U.S. Environmental Protection Agency, Washington, District of Columbia, March, 1978.

7. AEROS Volume II, EPA 450/2-76-029, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 1976.

8. N. deNevers and J.R. Morris, "Rollback Modeling; Basic and Modified", Journal of the Air Pollution Control Association, 25, 943, September, 1975.

9. Freas, W.P., "Data Base for Air Quality Impact Assessment of Proposed Heavy-Duty Vehicle Emission Standards", Memorandum to M. Wolcott, U.S. Environmental Protection Agency, Ann Arbor, Michigan, March, 1980.

10. Wallace, J., "MOBILE1 Modifications and Emission Rate Assumptions for the LDT and HDV NOx Regulatory Analysis", Memorandum to J. Anderson, U.S. Environmental Protection Agency, Ann Arbor, Michigan, June, 1980.

Appendix A

Mobile Source Emission Factor Estimates

BASE CASE FOR THE NOX REG PACKAGE 5/02/80

EMISSION FACTOR MODIFICATION PROFILE:

REGION	MODE	POLLUTANT	FIRST MY	LAST MY	BASE	DEL	ALTERED
1	2	1	1983	1999	0.80	0.35	YES
1	2	2	1983	1999	11.70	4.31	YES
1	3	1	1983	1999	0.80	0.35	YES
1	3	2	1983	1999	11.70	4.31	YES
1	2	3	1985	1999	1.73	0.11	YES
1	3	3	1985	1999	1.73	0.11	YES
1	4	3	1985	1999	9.50	0.0	YES
1	5	3	1985	1999	18.90	0.0	YES
2	4	3	1985	1999	7.30	0.0	YES
2	5	3	1985	1999	13.00	0.0	YES
3	2	3	1985	1999	1.07	0.11	YES
3	3	3	1985	1999	1.07	0.11	YES
3	4	3	1985	1999	5.89	0.0	YES
3	5	3	1985	1999	12.30	0.0	YES

*NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	6.68	7.47	10.27	20.40	4.10	10.72	7.49
EXHAUST CO:	59.18	63.51	78.24	253.67	11.28	35.23	67.68
EXHAUST NOx:	3.24	3.29	5.45	10.03	22.10	0.14	4.25

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	4.77	5.89	8.75	18.22	4.10	7.17	5.66
EXHAUST CO:	47.07	57.14	73.17	256.29	11.28	26.44	57.37
EXHAUST NOx:	2.66	2.73	4.71	9.76	21.20	0.26	3.67

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.88	3.44	4.91	12.43	3.69	1.97	2.67
EXHAUST CO:	17.17	37.69	46.48	221.91	11.28	7.91	29.05
EXHAUST NOx:	1.81	2.42	3.28	9.62	19.39	0.47	2.82

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.00	2.46	3.10	6.07	2.86	0.46	1.49
EXHAUST CO:	9.39	29.28	34.03	105.62	11.28	3.36	16.33
EXHAUST NOx:	1.59	2.39	2.75	9.59	19.00	0.18	2.60

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.85	2.12	2.47	3.27	2.68	0.31	1.18
EXHAUST CO:	7.83	26.83	30.16	56.72	11.28	2.87	12.51
EXHAUST NOx:	1.57	2.41	2.57	9.53	18.92	0.16	2.57

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.82	2.03	2.21	2.21	2.64	0.31	1.09
EXHAUST CO:	7.58	26.03	28.40	40.13	11.28	2.87	11.41
EXHAUST NOx:	1.57	2.43	2.51	9.54	18.90	0.16	2.56

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	6.73	7.34	10.71	25.41	4.35	10.42	7.78
EXHAUST CO:	53.91	63.52	77.47	264.26	29.45	36.05	64.45
EXHAUST NOx:	2.89	3.03	5.38	9.95	21.41	0.14	3.92

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F). 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	4.60	5.45	8.42	19.17	4.39	6.88	5.53
EXHAUST CO:	37.67	53.43	70.34	254.91	27.88	27.36	49.90
EXHAUST NOx:	2.26	2.50	4.34	9.33	18.04	0.26	3.19

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.79	2.63	4.09	11.11	3.68	1.48	2.45
EXHAUST CO:	15.14	26.40	39.07	193.16	27.20	8.46	25.53
EXHAUST NOx:	1.61	1.93	2.67	8.49	14.80	0.47	2.40

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.00	1.63	2.24	5.91	2.97	0.40	1.39
EXHAUST CO:	10.05	15.91	21.70	93.40	27.02	3.46	15.31
EXHAUST NOx:	1.50	1.66	2.15	7.74	13.37	0.18	2.19

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.86	1.25	1.51	3.13	2.83	0.31	1.08
EXHAUST CO:	8.79	12.28	15.53	52.57	27.00	2.87	11.88
EXHAUST NOx:	1.49	1.63	2.01	7.45	13.06	0.16	2.15

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.83	1.17	1.29	2.27	2.80	0.31	1.00
EXHAUST CO:	8.60	11.12	12.60	38.16	27.00	2.87	10.85
EXHAUST NOx:	1.49	1.62	2.00	7.37	13.01	0.16	2.14

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	8.47	9.37	13.39	40.33	5.86	13.96	10.19
EXHAUST CO:	83.67	89.22	118.42	401.39	48.98	48.62	99.06
EXHAUST NOx:	2.22	2.19	3.45	6.40	12.10	0.08	2.77

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	5.93	7.18	11.33	36.35	5.93	10.08	7.70
EXHAUST CO:	63.85	75.59	105.81	386.96	45.73	36.30	80.80
EXHAUST NOx:	2.09	1.85	3.05	6.28	12.16	0.16	2.62

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	2.17	3.87	5.94	20.78	4.71	2.70	3.40
EXHAUST CO:	20.87	43.78	57.33	275.33	39.44	10.49	36.29
EXHAUST NOx:	1.62	1.69	2.21	6.19	12.27	0.17	2.19

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.05	2.12	3.04	9.50	3.18	0.51	1.67
EXHAUST CO:	9.90	21.89	28.82	119.80	29.65	3.58	17.22
EXHAUST NOx:	1.55	1.71	1.96	6.05	12.29	0.15	2.11

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.86	1.52	1.95	4.49	2.88	0.31	1.18
EXHAUST CO:	7.89	15.16	18.91	61.74	27.54	2.88	11.96
EXHAUST NOx:	1.57	1.75	1.87	5.94	12.30	0.16	2.12

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.82	1.33	1.48	2.55	2.81	0.31	1.03
EXHAUST CO:	7.58	12.49	14.29	40.86	27.14	2.87	10.34
EXHAUST NOx:	1.57	1.77	1.85	5.93	12.30	0.16	2.12

CONTROL CASE FOR THE NOX REG PACKAGE 5/02/80

*NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	6.68	7.47	10.27	20.40	4.10	10.72	7.49
EXHAUST CO:	59.18	63.51	78.24	253.67	11.28	35.23	67.68
EXHAUST NOx:	3.24	3.29	5.45	10.03	22.10	0.14	4.25

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	4.77	5.89	8.75	18.22	4.10	7.17	5.66
EXHAUST CO:	47.07	57.14	73.17	256.29	11.28	26.44	57.37
EXHAUST NOx:	2.66	2.73	4.71	9.76	21.20	0.26	3.67

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.88	3.21	4.72	12.43	3.69	1.97	2.65
EXHAUST CO:	17.17	34.18	43.45	221.91	11.28	7.91	28.67
EXHAUST NOx:	1.81	2.31	3.21	9.15	17.87	0.47	2.74

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.00	1.57	2.26	6.07	2.86	0.46	1.39
EXHAUST CO:	9.39	16.20	21.74	105.62	11.28	3.36	14.86
EXHAUST NOx:	1.59	1.50	1.97	5.05	7.37	0.18	1.94

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.85	0.98	1.28	3.27	2.68	0.31	1.05
EXHAUST CO:	7.83	10.13	12.91	56.72	11.28	2.87	10.54
EXHAUST NOx:	1.57	1.16	1.38	3.18	4.58	0.16	1.70

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: 49-STATE 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.82	0.76	0.83	2.21	2.64	0.31	0.94
EXHAUST CO:	7.58	7.56	8.50	40.13	11.28	2.87	9.18
EXHAUST NOx:	1.57	1.08	1.17	2.69	4.14	0.16	1.64

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	6.73	7.34	10.71	25.41	4.35	10.42	7.78
EXHAUST CO:	53.91	63.52	77.47	264.26	29.45	36.05	64.45
EXHAUST NOx:	2.89	3.03	5.38	9.95	21.41	0.14	3.92

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	4.60	5.45	8.42	19.17	4.39	6.88	5.53
EXHAUST CO:	37.67	53.43	70.34	254.91	27.88	27.36	49.90
EXHAUST NOx:	2.26	2.50	4.34	9.33	18.04	0.26	3.19

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F). 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.79	2.63	4.08	11.11	3.68	1.48	2.45
EXHAUST CO:	15.14	26.21	38.85	193.16	27.20	8.46	25.51
EXHAUST NOx:	1.61	1.93	2.67	8.15	13.88	0.47	2.36

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.00	1.35	1.97	5.91	2.97	0.40	1.36
EXHAUST CO:	10.05	13.12	18.98	93.40	27.02	3.46	14.99
EXHAUST NOx:	1.50	1.66	2.15	4.55	6.33	0.18	1.82

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.86	0.86	1.07	3.13	2.83	0.31	1.03
EXHAUST CO:	8.79	8.38	11.30	52.57	27.00	2.87	11.41
EXHAUST NOx:	1.49	1.63	2.01	3.02	4.39	0.16	1.68

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: CALIF. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.83	0.71	0.76	2.27	2.80	0.31	0.95
EXHAUST CO:	8.60	6.71	7.60	38.16	27.00	2.87	10.31
EXHAUST NOx:	1.49	1.62	2.00	2.61	4.07	0.16	1.65

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1977 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	8.47	9.37	13.39	40.33	5.86	13.96	10.19
EXHAUST CO:	83.67	89.22	118.42	401.39	48.98	48.62	99.06
EXHAUST NOx:	2.22	2.19	3.45	6.40	12.10	0.08	2.77

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1980 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	5.93	7.18	11.33	36.35	5.93	10.08	7.70
EXHAUST CO:	63.85	75.59	105.81	386.96	45.73	36.30	80.80
EXHAUST NOx:	2.09	1.85	3.05	6.28	12.16	0.16	2.62

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1985 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	2.17	3.81	5.88	20.78	4.71	2.70	3.40
EXHAUST CO:	20.87	43.19	56.74	275.33	39.44	10.49	36.22
EXHAUST NOx:	1.62	1.64	2.18	5.94	11.28	0.17	2.14

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1990 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	1.05	1.76	2.70	9.50	3.18	0.51	1.63
EXHAUST CO:	9.90	18.89	25.88	119.80	29.65	3.58	16.88
EXHAUST NOx:	1.55	1.26	1.56	3.72	4.72	0.15	1.72

B 415/10

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1995 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.86	1.03	1.43	4.49	2.88	0.31	1.12
EXHAUST CO:	7.89	11.17	14.57	61.74	27.54	2.88	11.47
EXHAUST NOx:	1.57	1.09	1.24	2.75	2.97	0.16	1.61

VEH. TYPE: LDV LDT1 LDT2 HDG HDD MC
CAL. YEAR: 1999 TEMP: 75.0(F) 0.803/0.058/0.058/0.045/0.031/0.005
REGION: HI-ALT. 26.0/16.0/26.0 MPH (20.0) 20.6/ 27.3/ 20.6
LDV I/M PROGRAM STARTING IN 1982, STRINGENCY LEVEL 30%, MECH. TRAINING: NO
I/M PROG. BENEFITS APPLY ONLY TO MODEL YEARS 1951 THROUGH 1999

COMPOSITE EMISSION FACTORS (GM/MILE)

	LDV	LDT1	LDT2	HDG	HDD	MC	ALL MODES
NON-METH HC:	0.82	0.78	0.86	2.55	2.81	0.31	0.96
EXHAUST CO:	7.58	8.01	9.20	40.86	27.14	2.87	9.78
EXHAUST NOx:	1.57	1.05	1.13	2.50	2.69	0.16	1.58